

PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

SEPPO LAINE OY
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FINLANDE

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(PCT Rule 71.1)

| | | | |
|-------------------------------------------------------------|----------------------------------------------------------|----------------------------------------------|------------|
| | | Date of mailing (day/month/year) | 23.08.2005 |
| Applicant's or agent's file reference MRE29PCT/P2364PC00 | | IMPORTANT NOTIFICATION | |
| International application No. PCT/FI2004/000201 | International filing date (day/month/year) 01.04.2004 | Priority date (day/month/year) 01.04.2003 | |
| Applicant M-REAL OYJ et al. | | | |

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary report on patentability and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.
4. **REMINDER**

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary report on patentability. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

The applicant's attention is drawn to Article 33(5), which provides that the criteria of novelty, inventive step and industrial applicability described in Article 33(2) to (4) merely serve the purposes of international preliminary examination and that "any Contracting State may apply additional or different criteria for the purposes of deciding whether, in that State, the claimed inventions is patentable or not" (see also Article 27(5)). Such additional criteria may relate, for example, to exemptions from patentability, requirements for enabling disclosure, clarity and support for the claims.

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|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465 | Authorized Officer Fernández Gomez, L Tel. +49 89 2399-7449 |  |
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PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

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| Applicant's or agent's file reference MRE29PCT/P2364PC00 | FOR FURTHER ACTION | | See Form PCT/IPEA/416 |
| International application No. PCT/FI2004/000201 | International filing date (day/month/year) 01.04.2004 | Priority date (day/month/year) 01.04.2003 | |
| International Patent Classification (IPC) or national classification and IPC D21H27/30 | | | |
| <p>Applicant M-REAL OYJ et al.</p> <p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 6 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> (<i>sent to the applicant and to the International Bureau</i>) a total of 5 sheets, as follows:</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions). <input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box. <p>b. <input type="checkbox"/> (<i>sent to the International Bureau only</i>) a total of (indicate type and number of electronic carrier(s)), containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p> <p>4. This report contains indications relating to the following items:</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Box No. I Basis of the opinion <input type="checkbox"/> Box No. II Priority <input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability <input type="checkbox"/> Box No. IV Lack of unity of invention <input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement <input type="checkbox"/> Box No. VI Certain documents cited <input type="checkbox"/> Box No. VII Certain defects in the international application <input type="checkbox"/> Box No. VIII Certain observations on the international application | | | |
| Date of submission of the demand 01.11.2004 | Date of completion of this report 23.08.2005 | | |
| Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465 | Authorized Officer Settele, U Telephone No. +49 89 2399-7150 | | |



INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY

International application No.
PCT/FI2004/000201

Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
 - This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
 - international search (under Rules 12.3 and 23.1(b))
 - publication of the international application (under Rule 12.4)
 - international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements*** of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

Description, Pages

1-28 as published

Claims, Numbers

1-33 received on 06.07.2005 with letter of 29.06.2005

- a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing
- 3. The amendments have resulted in the cancellation of:
 - the description, pages
 - the claims, Nos.
 - the drawings, sheets/figs
 - the sequence listing (*specify*):
 - any table(s) related to sequence listing (*specify*):
- 4. This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
 - the description, pages
 - the claims, Nos.
 - the drawings, sheets/figs
 - the sequence listing (*specify*):
 - any table(s) related to sequence listing (*specify*):

* If item 4 applies, some or all of these sheets may be marked "superseded."

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International application No.
PCT/FI2004/000201

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

| | | | |
|-------------------------------|------|--------|------------------|
| Novelty (N) | Yes: | Claims | 14,15,26-30 |
| | No: | Claims | 1-13,16-25,31-33 |
| Inventive step (IS) | Yes: | Claims | 14,15,26-30 |
| | No: | Claims | 1-13,16-25,31-33 |
| Industrial applicability (IA) | Yes: | Claims | 1-33 |
| | No: | Claims | |

2. Citations and explanations (Rule 70.7):

see separate sheet

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Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Reference is made to the following documents:
D1: US-A-6 162 596
D2: US-A-5 910 385

2. The applicants arguments given in the letter of 29.06.2005 have been carefully considered and the examiner has come to the following conclusions:
 - 2.1 The amended set of claims 1-33 filed with letter of 29.06.2005 seems not to extend beyond the content of the application as originally filed.
 - 2.2 However, despite the amendments introduced with the new set of claims the examiner still maintains the objections concerning novelty and inventive step against the new set of claims and there are additionally objections concerning clarity of the new set of claims.

3. The subject-matter of the claims does not meet the requirements of Article 6 PCT.
 - 3.1 The applicant introduced the new feature "the second layer fitted under the surface of the product". However, it is not clear what is meant with the surface of the product. It appears that the first layer is meant and that the first layer is the surface layer of the product and the second layer lies under the first layer away from the surface of the product.
In addition, this new feature is not added into independent claim 16. Thus, the method of claim 16 does not lead to the product of claim 1 and is not in consistency with claim 1.

4. The present application does not meet the criteria of Article 33(1) PCT, because the

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subject-matter of claims 1 and 16 is not new in the sense of Article 33(2) PCT.

- 4.1 Concerning independent claim 1, the document D1 discloses (the references in parentheses applying to this document):
- multilayered product comprising (claim 1)
 - at least one layer, which is formed by cellulosic or lignocellulosic fibers (claim 1; col. 4, l. 53-59), and
 - at least one second layer, which is fitted adjacent to the first layer or at a distance therefrom (claim 1), characterized in that
 - the second layer contains a synthetic, electrically conductive polymer, which is mixed with a binder which forms a binder matrix (claim 1),
 - whereby the second layer is at least partially electrically conductive (claim 1).

The newly introduced feature that "the second layer fitted under the surface of the product" is already disclosed in D1 (col. 1, l. 52-54; col. 3, l. 8-10; col. 6, l. 12-21) as well as "paper or cardboard" (D1: col. 4, l. 59).

D2 (claim 1,4,5) also discloses the subject-matter of new claim 1.

- 4.2 Concerning independent claim 16, the document D1 discloses (the references in parentheses applying to this document):
- method for producing a multilayered product, which method comprises producing (col. 10, l. 4-61)
 - at least one fibrous layer, which is formed by cellulosic or lignocellulosic fibers (col. 4, l. 53-59), and
 - at least one layer of an adhesive agent arranged on top of the fibrous layer (claim 1; col. 10, l. 4-61), characterized in that
 - layer of the adhesive agent is formed from a mixture, which contains synthetic, electrically conductive polymer, which is mixed with a binder (claim 1; col. 10, l. 4-61), and
 - this mixture is applied upon the fibrous layer (claim 1; col. 10, l. 4-61).

The newly introduced limitation of "paper or cardboard" is already disclosed in D1 (col. 4, l. 59).

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5. Dependent claims 2-13,17-25 and 31-33 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty and/or inventive step, see documents D1 and D2 and the corresponding passages cited in the search report.
6. The combination of the features of dependent claims 14,15 and 26-30 is neither known from, nor rendered obvious by, the available prior art. The reasons are as follows:
Neither D1 nor D2 discloses the subject-matter of claims 14,15 and 26-30. Thus, the subject-matter of these dependent claims should have been introduced into the independent claims 1 and 16.
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nt
claim
s 1
and
16.
7. The description should have been brought in conformity with the claims.

Claims:

1. Multilayered paper or cardboard product comprising
 - 5 – at least one first layer, which is formed by cellulosic or lignocellulosic fibres, and
 - at least one second layer, which is fitted adjacent to the first layer or at a distance therefrom,
c h a r a c t e r i z e d in that
 - the second layer is fitted under the surface of the product and
 - 10 – it contains a synthetic, electrically conductive polymer, which is mixed with a binder which forms a binder matrix,
whereby the second layer is at least partially electrically conductive.
2. The multilayered product according to claim 1, **c h a r a c t e r i z e d** in that
 - 15 the binder forms a homogeneous mixture together with the electrically conductive polymer.
3. The multilayered product according to claim 1, **c h a r a c t e r i z e d** in that
 - 20 the binder of the second layer comprises a binder that dissolves or disperses in water.
4. The multilayered product according to claim 3, **c h a r a c t e r i z e d** in that the binder comprises dextrin, carboxymethyl cellulose, poly(vinyl alcohol), poly(vinyl acetate) or a binder based on starch or a starch derivative.
- 25 5. The multilayered product according to any of the preceding claims, **c h a r a c t e r i z e d** in that it comprises two first layers which have been bonded together by a second layer fitted inbetween them.
- 30 6. The multilayered product according to claim 5, **c h a r a c t e r i z e d** in that the first layers are formed by fibrous webs.
7. The multilayered product according to claim 6, **c h a r a c t e r i z e d** in that the fibrous webs are formed by unsymmetrical paper or cardboard webs.

8. The multilayered produced according to any of the preceding claims, characterized in that it further comprises a third layer which is arranged on top of the first or the second layer.
- 5 9. The multilayered product according to claim 8, characterized in that the third layer is formed by a plastic film, which has been extruded on the surface of the product.
- 10 10. The multilayered product according to claims 8, characterized in that the third layer is formed by a layer of a coating colour.
- 15 11. The multilayered product according to any of the preceding claims, characterized in that the second layer contains an electrically conductive polymer selected from the group of polyaniline, polypyrrol and polythiophene.
- 20 12. The multilayered product according to any of the preceding claims, characterized in that concentration of the electrically conductive polymer in the second layer is about 0.1 to 10 weight-%.
- 25 13. The multilayered product according to claim 12, characterized in that surface resistivity of the second layer is about $10^{exp}2$ to $10^{exp}11$ Ohm.
- 30 14. The multilayered product according to any of the preceding claims, characterized in that the electrical conductivity of the electrically conductive polymer of the second layer is locally adjusted to form a pattern of electrical conductivity or electrical non-conductivity, respectively.
15. The multilayered product according to any of the preceding claims, characterized in that the surface of the multilayered product is provided with a visual marking which indicates the layer containing the electrically conductive polymer.
- 30 16. Method for producing a multilayered paper or cardboard product, which method comprises producing
 - at least one fibrous layer, which is formed by cellulosic or lignocellulosic fibres, and

- at least one layer of an adhesive agent arranged on top of the fibrous layer below the surface of the product,
characterized in that
 - the layer of the adhesive agent is formed from a mixture, which contains synthetic, electrically conductive polymer, which is mixed with a binder, and
 - this mixture is applied upon the fibrous layer.
17. The method according to claim 16, characterized in that binder mixture is applied as an at least partially continuous layer on top of the fibrous layer and is allowed to attach thereto.
18. The method according to claim 16 or 17, characterized in that the binder is used for attaching two fibrous layers to each other.
19. The method according to any of claims 14 to 18, characterized in that the electrically conductive polymer is mixed in the form of a dispersion into the binder.
20. The method according to any of claims 14 to 19, characterized by producing a binder mixture in which the concentration of the electrically conductive polymer is about 0.1 to 10 % of the weight of the mixture.
21. The method according to any of claims 14 to 20, characterized in that the binder is water-soluble or water-dispersable, and it comprises, e.g., dextrin, carboxymethyl cellulose, poly(vinyl alcohol), poly(vinyl acetate) or a binder based on starch or a starch derivative.
22. The method according to any of claims 14 to 21, characterized in that the electrically conductive polymer is used in doped form.
23. The method according to claim 22, characterized in that the electrically conductive polymer is mixed with the binder at acid pH, preferably at a pH of 1 to 6.5.
24. The method according to any of claims 14 to 23, characterized in that

the surface resistivity of the binder layer formed can be adjusted to a value in the range of 10^{exp2} to 10^{exp11} .

25. The method according to any of claims 14 to 24, characterized in that
5 the binder mixture is applied on a fibrous web having a pH of 8 at the most.
26. The method according to any of claims 14 to 25, characterized in that the
electrical conductivity of the polymer is changed by doping the electrically conductive
polymer or by dedoping the electrically conductive polymer, respectively.
10
27. The method according to claim 26, characterized in that the electrically non-
conductive polymer is doped by treating the polymer layer with an acid solution, which is
used for painting a desired pattern on the surface of the paper or cardboard product.
- 15 28. The method according to claim 26, characterized in that the electrically
conductive polymer is dedoped by treating the polymer layer with an alkaline solution,
which is used for painting a desired pattern on the surface of the paper or cardboard
product.
- 20 29. The method according to any of claims 26 to 28, characterized in that
electrically conductive polymer is doped by printing a desired pattern on the surface of the
paper or cardboard product by using a printing colour which is capable of doping or
dedoping the electrically conductive polymer.
- 25 30. The method according to any of claims 14 to 29, characterized in that
a pattern is printed on the surface of the paper or cardboard product for indicating how the
electrical conductivity of the second layer can be detected.
- 30 31. The method according to any of claims 14 to 30, characterized in that
a third layer is fitted upon the first or the second layer.
32. The method according to claim 31, characterized in that the third layer is
formed by a plastic film, which is extruded on top of the product.

33. The method according to claim 31, characterized in that the third layer is formed by a layer of a coating colour.